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Visionary leadership: the mediating role of organizational support on nurse interns' creativity and organizational effectiveness

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Abstract

Aim This study examines the influence of visionary leadership on nurse interns' creativity and organizational effectiveness, with a particular focus on the mediating role of perceived organizational support.

Background Leadership, particularly in healthcare care, significantly influences employee experiences and outcomes. Visionary leaders support their employees to gain organizational commitment and improve their creativity. However, the impact of visionary leaders on creativity among nurses and organizational effectiveness requires further exploration. Organizational support plays a crucial mediating role in the relationship between visionary leadership and nurses' creativity. When nurses perceive strong organizational support, they feel more valued and are more likely to engage in creative behaviors.

Subjects and methods A descriptive correlational design was conducted among nurse interns in Mansoura University Hospitals, Egypt. Four standardized questionnaires were used to examine perceptions of visionary leadership, organizational support, creativity among nurse interns, and organizational effectiveness perception; 464 nurse interns were polled. The study's hypothetical model was examined using AMOS structural equation modeling (SEM).

Results Visionary leadership perception significantly affects nurse interns' creativity, organizational effectiveness, and perceived organizational support. As well, nurse interns' creativity significantly affects organizational effectiveness. Moreover, perceived organizational support mediates the relationship between visionary leadership as regards nurse interns' creativity and organizational effectiveness,

Conclusions In sum, fostering a supportive environment and employing visionary leadership can empower nurse interns to be more creative, leading to enhanced problem-solving, improved processes, and better overall performance within healthcare organizations. This emphasizes the importance of leadership and support in driving innovation and effectiveness in healthcare settings.

Clinical trial number Not applicable.

Keywords Visionary leadership, Organizational support, Creativity, Organizational effectiveness, Nurse interns

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Introduction

A nurse intern is a nurse who has finished her or his nursing degree and is registered to work in supervised training positions; the internship year is the first level of postgraduate training and is an important stage in any nurse's career. The intern year should strike a balance between education, training, and clinical responsibilities, allowing nursing interns to build the professional and personal competencies that result in safe patient care and create a foundation for lifetime learning [1]. Internship programs offer nursing interns practical clinical experience, fostering creativity, adaptability, and analytical skills. They also enhance their readiness for professional roles, self-development, and dedication to their work, promoting personal and professional growth [2].

With the increasing pressures and great challenges facing the healthcare sectors in various activities at present, there must be visionary leadership. A visionary leader can control the future, foresee potential events, and motivate others to take appropriate action. That means that visionary leaders can put the organization up to attain its best objectives by foreseeing opportunities and obstacles before they arise. Visionary leaders possess the ability to construct a "new dawn" through ingenuity, creativity, appreciation, and audacity [3]. Visionary leadership, as outlined in existing literature, encompasses five key sub-dimensions. The first is communication, which relates to the leader's ability to effectively convey ideas. Reliability is associated with leader trust. Risk involves the leader's capacity to maintain composure in uncertain situations. Respect is demonstrated by valuing the abilities, efforts, opinions, and feelings of team members. Finally, focus refers to the leader's attentiveness to staff members' input and their ability to articulate and acknowledge these perspectives [4].

In accordance with the organization's visionary goals, visionary leaders may give workers the right direction and support, foster a feeling of purpose, aid workers in finding fulfillment in their work, and boost their psychological empowerment [5]. In turn, Perceived Organizational Support (POS) amplifies the impact of visionary leadership by encouraging employees to align their efforts with the leader's vision and take proactive steps to achieve organizational goals. For example, visionary leaders who show genuine concern for their employees' development foster higher levels of POS, which can lead to improved performance, creativity, and organizational commitment [6].

POS reflects how much individuals perceive their workplace, appreciate their contribution to work, and tend to endorse their wellbeing [7]. Long hours, important decisions, and the emotional demands of patient care, particularly during emergencies like pandemics, frequently cause high levels of stress for healthcare professionals.

Peer assistance and fostering a supportive work environment are key components of meeting these demands [8]. POS positively impacts both organizations and employees, enhancing emotional commitment, performance, job satisfaction, and positive mood. Recognizing and rewarding creativity stimulates innovation. Organizations that value employee contributions and fulfill their needs can enhance POS, which involves recognizing, rewarding, appreciating, and encouraging creativity and stimulating innovative ideas [9].

Employee's creativity refers to his/her ability to generate a new concept or technique or to develop a new useful and profitable product or service. This definition encompasses all of the experiences and knowledge that a person has acquired throughout his life from his family, community, and educational institutions. Employee creativity is increased by the intricate work structure and the assistance managers and organizations provide [10]. Being creative is essential for coming up with new ideas and solving difficulties. In order to prepare for the future, nurses should exercise creativity in seeing their possible issues and the results that may follow. They ought to apply it to problem-solving and decision-making as well [11].

Fostering creativity and innovation to improve performance is a challenge for healthcare organizations. In this regard, the best ways to assist and improve an organization's effectiveness are through innovation and creativity [12]. Organizational effectiveness has been measured using a variety of metrics, including output, quality, efficiency, adaptability, satisfaction, competitiveness, growth, and survival [13]. To create organizational effectiveness, it is also vital to consider how members of the organization perceive the organization's capacity to accomplish its objectives [14].

This study aims to examine the influence of visionary leadership on nurse interns' creativity and organizational effectiveness, focusing on the mediating role of perceived organizational support; creativity is crucial for solving complex problems, especially in healthcare, where unexpected challenges arise. Without creativity, nurse interns may struggle to adapt to unique situations, which could compromise patient safety. A lack of creativity may lead to standardized approaches that fail to meet individual needs, reducing patient satisfaction and outcomes [15]. By examining these interactions, insights can be gained into the mechanisms through which visionary leadership influences nurse outcomes, thereby informing leadership practices and organizational interventions aimed at improving nurses' well-being and performance in healthcare settings.

Literature review and hypothesis development

Visionary leadership is one of the many modern leadership issues that emerged after the 1990s, which is a leadership issue that is of great importance. The capacity to formulate a consistent, acceptable, private, and appealing future vision for the organization as a whole or for a specific division and to communicate this vision is known as visionary leadership [16]. Some academics claim that visionary leadership has a particularly significant impact on developing trust in new businesses, accommodating workers, enhancing motivation, growing employee loyalty, and raising worker performance levels [17]. Leading with vision necessitates creative skills, strong, dependable, intelligent, kind, genuine attitude, strong language, clear emotion expression, coaching, listening, consistency, and willingness to sacrifice [18].

Visionary leaders are characterized by several distinct attributes: (a) possessing a clear foresight into the future, acting as a source of motivation, focusing on empowering others to achieve optimal performance, and providing clear and actionable guidance; (b) demonstrating unwavering trust, readiness to take risks, and recognizing the value of resources—particularly human resources—by offering appropriate care and organizational support; (c) inspiring individuals to work collaboratively and diligently toward shared goals, serving as role models who consistently embody leadership ideals, providing constructive feedback, and expressing gratitude for the efforts and achievements of everyone in the organization (organizational effectiveness); and (d) crafting a clear and inspiring vision, turning “dreams” into reality, encouraging change, and motivating individuals to work harder and more creatively to improve situations and conditions [19].

Visionary leaders can stimulate employee creativity by helping employees to understand the organizational vision and by arousing enthusiasm for the shared vision, which creates a positive climate for creativity [20]. A leader’s influence on individual performance may not necessarily indicate that leader’s influence on performance at the organization level [19]. Therefore, the study proposed the following hypotheses:

H1: Visionary leadership positively influences nurse interns’ creativity.

H2: Visionary leadership positively influences organizational effectiveness.

Meanwhile, creativity is considerably influenced by organizational factors that may either encourage or prohibit any innovative approaches, and thus such factors should be addressed to promote creativity and flourishing [21]. Creativity in nursing can be applied in many contexts,

such as clinical practice, research, education, and management. These domains obviously have interactions with one another. The art of nursing care is buried within the profession and not readily apparent to the general public because creativity in this field is still a relatively new idea and is therefore viewed less than other concepts [22]. In order to improve organizational effectiveness, organizations must promote creative behavior among their employees [9]. Consequently, the study put forward the following hypothesis:

H3: Nurse interns’ creativity positively influences organizational effectiveness.

Implementing innovative ideas enhances organizational effectiveness, which refers to an organization’s ability to utilize resources efficiently to achieve its objectives. It is often measured by employee involvement and job satisfaction. Key factors influencing job satisfaction include effective communication with supervisors, fair compensation, and the ability to perform job responsibilities efficiently [23]. Employee satisfaction is a crucial indicator of organizational effectiveness, as it directly influences performance, innovation, and sustainability. Satisfied employees are more motivated, productive, and committed to achieving organizational goals [24].

According to organizational support theory (OST), employees develop POS in response to socio-emotional needs and the organization’s readiness to reward increased efforts made on its behalf [25]. Healthcare professionals face high stress due to heavy workloads, long shifts, fast-paced environments, safety concerns, moral dilemmas, job insecurity, workplace bullying, and lack of social support. Organizational support plays a crucial role in mitigating stress caused by work demands [8]. A supportive work environment builds trust and belonging, empowering nurse interns to think creatively and innovate in healthcare [26]. In healthcare, POS enhances organizational effectiveness by boosting job satisfaction, reducing turnover, and improving performance. Supported staff show greater commitment, collaboration, and alignment with organizational goals while strengthening resilience and productivity [27].

Visionary leadership, with its inspiring and future-oriented approach, boosts employee motivation and fosters innovation. However, its impact on creativity is strengthened when employees experience strong organizational support [28]. POS acts as a psychological bridge that converts the motivational influence of visionary leadership into concrete creative actions. For nurse interns, who are still developing in their careers, organizational support boosts their confidence and encourages them to take creative risks [6]. Moreover, visionary leadership enhances organizational effectiveness by providing clear

purpose and motivation. However, its impact is maximized through the mediating role of POS, which boosts employee confidence, fosters a supportive environment, and facilitates goal achievement [28]. As a result, the study formulated the following hypotheses:

H4: Perceived organizational support mediates the relationship between visionary leadership and nurse interns' creativity.

H5: Perceived organizational support mediates the relationship between visionary leadership and organizational effectiveness.

Despite the growing recognition of the importance of visionary leadership in enhancing organizational outcomes, there remains limited research on its specific impact on nurse interns' creativity and organizational effectiveness, particularly through the lens of organizational support. While existing literature highlights the role of leadership in fostering innovation and improving performance, there is a lack of empirical studies exploring the mediating role of organizational support in healthcare settings, especially among nurse interns. Studies often overlook the unique challenges faced by healthcare interns and the role of organizational support in enhancing creativity. This is particularly important for nursing interns, who can significantly contribute to organizational effectiveness with appropriate leadership and support. Thus, this study aims to fill this gap by investigating the mediating effect of organizational support on the relationship between visionary leadership as regards nurse interns' creativity and organizational effectiveness, providing new insights into leadership practices that can enhance the performance of healthcare institutions.

Using the five assumptions indicated above, the conceptual research model is given as follows (Fig. 1):

The study objective

The purpose of this study is to examine the influence of visionary leadership on nurse interns' creativity and organizational effectiveness, with a particular focus on the mediating role of perceived organizational support.

Methodology

Study design

A descriptive-correlational design was chosen. This design combines descriptive and correlational methods to describe population characteristics and examine relationships between variables, assessing factors' relationships and identifying patterns or trends [29].

Study setting

The research was conducted at all Mansoura University Hospitals which provides a wide spectrum of free and economical health services in the delta region. Mansoura University Hospitals is occupied with 3421 beds, and it consists of many hospitals as (Pediatric Hospital, Main Mansoura University Hospital, Emergency Hospital, Oncology Center, Urological Center, GIT Center, Specialized Medical Hospital, and Student Hospital) in Mansoura City, Egypt.

Participants

Participants were selected using a systematic random sampling process. An open-source sample size calculator that is available at <https://www.calculator.net/sample-size-calculator.html> was utilized to establish the required sample size by computing the overall population size of the prior hospitals (Mansoura University Hospitals). The required sample size was determined at confidence

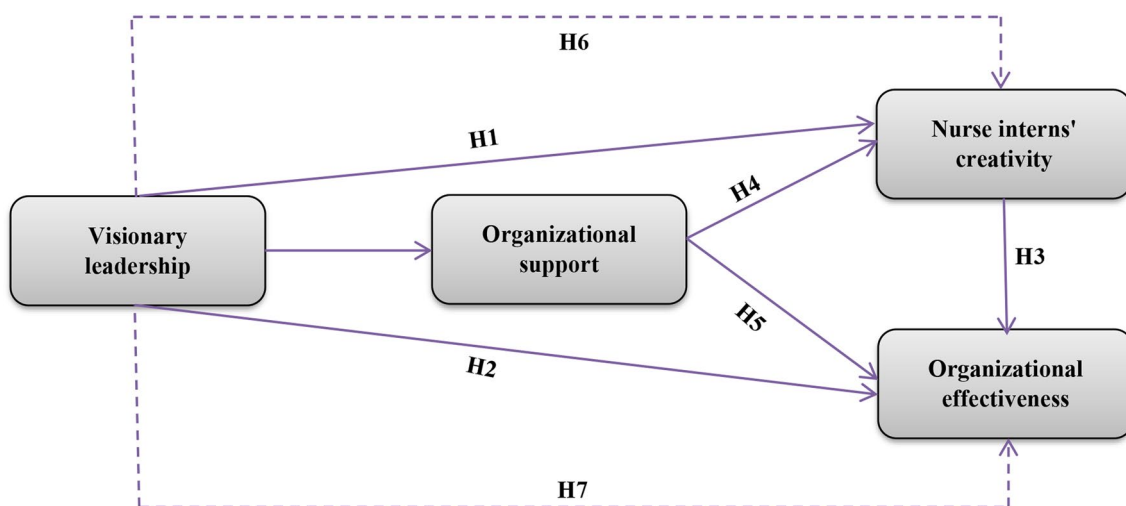


Fig. 1 The conceptual model of the study

level = 95%, margin of errors = 5.0%, population proportion = 50%, and total population size = 810 internship students who actively participating in hands-on patient care and clinical rotations in hospitals; accordingly, the required sample size was 464 nurse interns who enrolled in the nursing internship program for the academic year 2023–2024 and had a duration of 3–6 months after starting the internship program to ensure familiarity with the leadership style and organizational environment, from both genders, as well as those who expressed a desire to engage in the study voluntarily. Following that, a systematic sampling formula for calculating interval was used to select participants, in which the sampling interval, denoted as k , is calculated by dividing the total population size (N) by the sample size (n) = $N/n = 810/464 = 2$. Once the sampling interval is determined, a random starting point is chosen from the first two nursing interns and it was the second student followed by four, and so on until the necessary number was obtained.

Instruments used in the study

The data for this study were gathered using four standardized scales that were originally developed in English and translated into Arabic.

Visionary leadership scale (VLS)

The 17-item Likert scale (e.g. my manager can see the effects of his or her actions), developed from earlier research, is used to assess nurse interns' perceptions of their supervisor's visionary leadership style. Sashkin [30] created the "Leadership Behavior Questionnaire". The responses were scored on a five-point Likert scale, from strongly disagree (1) to strongly agree (5). The score of the items was summed up and totally divided by the number of the items, gives a mean score then transformed to overall mean of Likert scale on SPSS. Possible scores range from 1 to 5. The tool's scoring system is categorized according to the following cutoff points: Scores > 3.75 indicated a high perception of visionary leadership, scores 2.5–3.75 specified a moderate perception, and scores < 2.5 indicated a low perception. The Cronbach's α test indicated a high level of dependability (0.972).

Nurses' creativity scale

This scale was used to evaluate nurse interns' creativity. It has 13 items (e.g. I suggest new ways to achieve goals or objectives); three of them were adapted from Scott and Bruce [31], while the remaining ten were established by Zhou and George [32]. The responses to both scales were graded on a 5-point Likert scale from 1 to 5, with 1 indicating "strongly disagree," 2 indicating "disagree," 3 indicating "neutral," 4 indicating "agree," and 5 indicating "strongly agree." The score of the items was summed up

and totally divided by the number of the items, gives a mean score then transformed to overall mean of Likert scale on SPSS. Possible scores range from 1 to 5. The tool's scoring system is defined based on cutoff points as follows: Scores above 3.75 reflected a high level of creativity, scores between 2.5 and 3.75 indicated a moderate level, and scores below 2.5 represented a low level. The Cronbach's α test of the creativity scale was 0.953.

Models-based organizational effectiveness scale

This scale was established by Chiyem and Anayo [33]. It initially had 40 items established based on four organizational effectiveness models, however, six of them were removed by the validity jury to avoid confusions for nurse interns. The remaining 34 items were represented as follows: Goal attainment (10 items e.g. things are always done at the right time), system resources (6 items e.g. needed manpower is always acquired), internal processes (10 items e.g. employees attitude to work is always encouraging), and stakeholder (8 items e.g. Needs and expectations of the stakeholders are often met). Responses were rated on a five-point Likert scale, from strongly disagree (1) to strongly agree (5). The score of the items was summed up and totally divided by the number of the items, gives a mean score then transformed to overall mean of Likert scale on SPSS. Possible scores range from 1 to 5. The tool's scoring system is defined based on cutoff points as follows: Scores above 3.75 reflected a high level of organizational effectiveness, scores between 2.5 and 3.75 indicated a moderate level, and scores below 2.5 represented a low level. The Cronbach's α test for the entire scale was 0.984. The Cronbach's α test for the subscales were as follows: Goal attainment (0.951), system resources (0.938), internal processes (0.968), and stakeholder (0.962).

Perceived organizational support

This scale was developed by Eisenberger et al. [34] to assess employees' impressions of an organization's willingness to recognize and reward their achievements, indicating a concern for their well-being and contribution. This scale was used to evaluate nurse interns' perceptions of organizational support. The scale contains eight items (e.g. The organization values my contribution to its well-being) that assess an employee's perception of the organization's value for their contributions and nine items about the potential actions that the organization might take and could impact employees' well-being. The score of the items was summed up and totally divided by the number of the items, gives a mean score then transformed to overall mean of Likert scale on SPSS. Possible scores range from 1 to 5. The tool's scoring system is defined based on cutoff points as follows: Scores above 3.75 reflected a high level of perceived organizational

support, scores between 2.5 and 3.75 indicated a moderate level, and scores below 2.5 represented a low level. The reliability coefficient alpha value was 0.919.

Demographic data of study participants

The participants' demographic information was obtained, including their age, gender, marital status, personal desire for entering the faculty, and work in addition to studying.

Validity of the tools

To ensure that participating nurse interns, whose primary language is Arabic, fully understood the study measures, all items were translated into Arabic. A panel of five university professors fluent in both Arabic and English reviewed the translation. Additionally, a second panel of five bilingual university professors conducted a back-translation of the measures from Arabic to English. To evaluate content and face validity, nine nursing professors (nursing administration specialist) who participated in the review process thoroughly examined the measures. The panelists confirmed that the measures were valid for use in this study and the following six items from the organizational effectiveness scale had to be removed in order to make the necessary modifications: Two items from the stakeholders' model (items 2 and 3) and four from the system resources model (items 5, 6, 7, and 8).

Pilot study

A pilot study was conducted to assess the quality and clarity of the intervention materials, the time required for data collection, and the feasibility, validity, and reliability of the study measurements. The pilot study included 46 students who met the inclusion criteria but were not part of the study population. The findings revealed that there was no need for changes, and the study's measures were unambiguous.

Data collection

Self-reported assessments from nursing internship students were employed to collect data for this study, which ran from the end of March to the end of May 2024. Before any data was collected, the necessary ethics approvals were acquired. The study's objectives were conveyed to the internship students during their initial encounter, which took place either via Google Meet or at each hospital. The lead investigator also requested their aid in facilitating the data collection process. Nurse interns who match the inclusion criteria will have higher perceived anonymity and lower possible response bias. Using the questionnaire's URL to fill it out and submit it: https://docs.google.com/forms/d/e/1FAIpQLSfV30sKdsBQNlaUpjyCf98O_BAikiI5qmY86azEtn5WVyKpJQ/viewform. The questionnaire's cover letter explained why the study was being done, assured participants that

their responses would be confidential and voluntary, and directed them to reflect on their contacts with a specific nurse manager. The voluntary completion and submission of the surveys indicated participation. By limiting direct engagement with the research team throughout the submission process, this technique seeks to establish a more unbiased and confidential environment in which authentic responses to the criteria can be supplied.

Ethical considerations and consent to contribute

The Ethics Committee of the Faculty of Nursing, Zagazig University, granted ethical approval under (reference number 184–24). All necessary information about the study was introduced in the first section of the sheet. The questionnaire included a statement related to the aim and nature of the study. All participants who chose the word agree to give their informed consent before beginning their response to the sheet. The respondents were guaranteed the privacy and confidentiality of their answers, the voluntary nature of their involvement, and the fact that their absence would not hurt their grades or result in any negative outcomes. This ensures that participants could freely choose to participate without the fear of academic repercussions. Participants have given their informed consent under the criteria outlined in the Helsinki Declaration. It was determined that participants had the right to withdraw from the study at any time. The right to withdraw was communicated both verbally and in writing at the outset of the study.

Statistical design

Data were analyzed using AMOS 22 and IBM SPSS 27. The study variables and nursing intern characteristics were provided using descriptive statistics. Independent t-tests were used to assess variations in visionary leadership, nursing intern creativity, organizational effectiveness, and perceived organizational support in relation to sample features. Pearson's correlation was utilized to investigate the bivariate connections between the research variables and their relevant subdomains. The proposed model was tested using AMOS Structural Equation Modeling (SEM) to analyze complex variable relationships while addressing measurement errors. It is particularly effective for testing mediation effects. Unlike traditional regression, SEM examines direct and indirect relationships simultaneously, offering a comprehensive understanding of the framework [35]. To ensure the robustness of the structural equation model (SEM), we indeed assessed model fit using several standard indices, including the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). Our model yielded a CFI of 0.95, a TLI of 0.94, an RMSEA of 0.045, and an SRMR of 0.04, which align

Table 1 Nurse interns' demographics and variances in the study variables (n = 464)

Characteristic	Category	No. (%)	Visionary leadership		Organizational support		Creativity		Organizational effectiveness	
			M (SD)	t (p)	M (SD)	t (p)	M (SD)	t (p)	M (SD)	t (p)
Age (years)	≤ 23	255 (54.96)	3.83 (0.86)	t = - 3.949	3.45 (0.76)	t = - 0.161	3.88 (0.72)	t = -	3.71 (0.83)	t = - 1.863
	> 23	209 (45.04)	4.12 (0.70)	(0.000)**	3.44 (0.70)	(0.87)	4.17 (0.63)	4.603 (0.000)	3.85 (0.76)	(0.06)
Gender	Male	135 (29.09)	4.04 (0.80)	t = - 1.373	3.60 (0.72)	t = - 3.038	4.09 (0.71)	t = -	3.91 (0.81)	t = - 2.336
	Female	329 (70.91)	3.93 (0.81)	(0.17)	3.38 (0.73)	(0.003)**	3.98 (0.68)	1.631 (0.10)	3.72 (0.79)	(0.02)*
Marital status	Single	372 (80.17)	3.95 (0.82)	t = 0.499	3.45 (0.74)	t = - 0.187	4.00 (0.70)	t = 0.548	3.78 (0.81)	t = - 0.406
	Married	92 (19.83)	4.00 (0.74)	(0.62)	3.43 (0.70)	(0.85)	4.05 (0.67)	(0.58)	3.75 (0.76)	(0.68)
Joining the faculty based on a personal desire	Yes	346 (74.57)	4.11 (0.68)	t = 5.986	3.51 (0.71)	t = 3.379	4.13 (0.62)	t = 5.820	3.90 (0.73)	t = 5.433
	No	118 (25.43)	3.53 (0.97)	(0.000)**	3.25 (0.77)	(0.001)**	3.66 (0.79)	(0.000)**	3.41 (0.88)	(0.000)**
Working alongside studying	Yes	250 (53.88)	4.09 (0.80)	t = 3.806	3.56 (0.73)	t = 3.899	4.11 (0.73)	t = 3.340	3.93 (0.78)	t = 4.641
	No	214 (46.12)	3.81 (0.79)	(0.000)**	3.30 (0.72)	(0.000)**	3.90 (0.64)	(0.001)**	3.59 (0.78)	(0.000)**

M = Mean. SD = Standard deviation. t = Independent t-test. * p is significant < 0.05 level (2-tailed). ** p is significant < 0.01 level (2-tailed)

Table 2 Distribution of different study variables' mean scores as reported by studied nurse interns (n = 464)

Study variables	Maximum	Mean	±	SD	% of mean score	α
Visionary leaderships	5	3.96	±	0.80	79.2 %	0.972
Perceived organizational support	5	3.44	±	0.73	68.8 %	0.919
Nurse interns' creativity	5	4.01	±	0.69	80.2 %	0.953
Organizational effectiveness domains:						
• Goal attainment	5	3.86	±	0.76	77.2 %	0.951
• System resources	5	3.77	±	0.89	75.4 %	0.938
• Internal process	5	3.71	±	0.92	74.1 %	0.968
• Stakeholder	5	3.77	±	0.88	75.3 %	0.962
Total organizational effectiveness	5	3.78	±	0.79	75.5 %	0.984

with the commonly accepted thresholds for a good model fit. The validity and reliability of the study constructs were assessed. P values with two tails < 0.05 indicated statistical significance and p-value with two tails < 0.01 indicated high statistical significance.

Results of the study

Table 1 shows nurse interns' demographics and variances in the study variables. 54.96% of the candidates were 23 years or younger. 70.91% and 80.17% of them were female and single, respectively. Additionally, 74.57% joined the faculty out of personal desire, and 53.88% worked alongside their studies. There was a considerable differences in visionary leadership perception and creativity level regarding nurse interns' ages ($p < 0.01$). Nurse interns' perception of organizational support and effectiveness levels differed significantly by gender ($p < 0.01$ and $p < 0.05$ respectively). There were statistically significant variations in the study variables regarding nurse interns' willingness to join the faculty and work while studying ($p < 0.01$).

Table 2 displays the distribution of the mean percent scores for the study variables as reported by the nurse interns under study. As seen in the table, the mean

percent score of visionary leadership was 79.2%, showing a strong perception of visionary leadership. The mean percent scores for nurse interns' creativity and organizational effectiveness were 80.2% and 75.5%, respectively, signifying high levels of both. Perceived organizational support had a mean percent score of 68.8%, validating a moderate level. Goal attainment constituted the highest mean percent score among organizational effectiveness domains, while internal processes had the lowest (77.2% and 74.1%, respectively).

Table 3 examines the correlation coefficients among the study variables. As observed from the table, there were significant and positive correlations between visionary leadership as regards nurse interns' creativity ($r = 0.686$, $p < 0.01$), organizational effectiveness ($r = 0.680$, $p < 0.01$), and organizational support ($r = 0.445$, $p < 0.01$). This suggests that when nurse interns experience visionary leadership, they tend to be more creative, which in turn improves the overall effectiveness of the organization. Likewise, when organizational support is present, these relationships are more likely to be strengthened, as support fosters an environment where creativity and effective leadership can thrive.

Table 3 Analyzing the correlation coefficients among the study variables (n = 464)

Variable	Visionary leadership	Perceived organizational support	Nurse interns' creativity	Goal attainment	System resources	Internal processes	Stakeholder
Perceived organizational support (r)	0.445*						
Nurse interns' creativity (r)	0.686*	0.438*					
Goal attainment (r)	0.672*	0.580*	0.682*				
System resources (r)	0.611*	0.522*	0.590*	0.829*			
Internal process (r)	0.627*	0.597*	0.553*	0.782*	0.841*		
Stakeholder (r)	0.610*	0.598*	0.568*	0.748*	0.791*	0.887*	
Total organizational effectiveness (r)	0.680*	0.624*	0.643*	0.904*	0.921*	0.955*	0.926*

r = Pearson correlation. *p-value is significant < 0.01 level (2-tailed)

Table 4 Tests of direct and indirect effects (n = 464)

Effects	β	P	BC 95% CI Lower/Upper
Direct effects:			
Visionary leadership to creativity	0.40	0.004*	0.312/0.488
Visionary leadership to organizational effectiveness	0.70	0.005*	0.430/0.943
Visionary leadership to organizational support	0.40	0.005*	0.301/0.495
Organizational support to creativity	0.12	0.005*	0.052/0.194
Organizational support to organizational effectiveness	0.78	0.005*	0.603/0.935
Creativity to organizational effectiveness	0.73	0.002*	0.450/1.132
Indirect effects:			
Visionary leadership to creativity via organizational support	0.05	0.002*	0.025/0.080
Visionary leadership to organizational effectiveness via organizational support	0.32	0.002*	0.239/0.428

BC = Biased-corrected percentile method. CI = Confidence interval. * (p) Significant level < 0.01

Correspondingly, perceived organizational support was found to be positively connected to nurse interns' creativity ($r=0.438$, $p<0.01$) and organizational effectiveness ($r=0.624$, $p<0.01$). This specifies that a supportive environment helps nurse interns to take risks, explore new ideas, and think creatively without fear of negative repercussions. Therefore, when nurse interns are encouraged to be creative, they develop more novel practices, improve processes, and provide better care. These improvements have a direct impact on the overall effectiveness of the healthcare organization.

Moreover, nursing interns' creativity was strongly associated with organizational effectiveness ($r=0.643$, $p<0.01$). This positive correlation suggests that nurse interns' creativity significantly improves organizational efficiency, patient outcomes, and goal achievement by fostering better problem-solving, enhancing overall efficiency, and driving effective goal achievement. Furthermore, the four dimensions of organizational effectiveness (goal attainment, system resources, internal processes,

and stakeholder) associated positively with visionary leadership, nurse interns' creativity, and perceived organizational support, where $p\text{-value}<0.01$.

Table 4 depicts the direct and indirect effects, as well as Fig. 2, which portrays the mediating effect of perceived organizational support on the relationship between visionary leadership as regards nurse interns' creativity and organizational effectiveness. As presented, visionary leadership significantly influenced directly nurse interns' creativity ($\beta=0.40$, $p<0.004$), organizational effectiveness ($\beta=0.70$, $p<0.005$), and perceived organizational support ($\beta=0.40$, $p<0.005$). As well, perceived organizational support significantly influenced directly nurse interns' creativity ($\beta=0.12$, $p<0.005$) and organizational effectiveness ($\beta=0.78$, $p<0.005$). Additionally, nurse interns' creativity had a significant direct effect on the organizational effectiveness ($\beta=0.73$, $p<0.002$).

There was a significant indirect effect of perceived organizational support on the relationship between visionary leadership and nurse interns' creativity ($\beta=0.05$, $p=0.002$, 95% CI 0.025/0.080), signifying that perceived organizational support acted as a mediating factor in the relationship between visionary leadership and nurse interns' creativity. Moreover, perceived organizational support had a significant indirect effect on the relationship between visionary leadership and organizational effectiveness ($\beta=0.32$, $p=0.002$, 95% CI 0.239/0.428). This suggests that perceived organizational support played a mediating role in the association between visionary leadership and organizational effectiveness.

Discussion

In this study, researchers set out to evaluate the influence of visionary leadership on nurse interns' creativity and organizational effectiveness and if perceived organizational support played a mediating role in these relationships. Nurses' creative performance is heavily influenced by the behaviors of leaders; thus, visionary leadership is crucial in improving it. The visionary leader sets the organizational vision by integrating employees' values, which fosters a supportive environment for them to work tirelessly toward attaining goals, which in turn improve

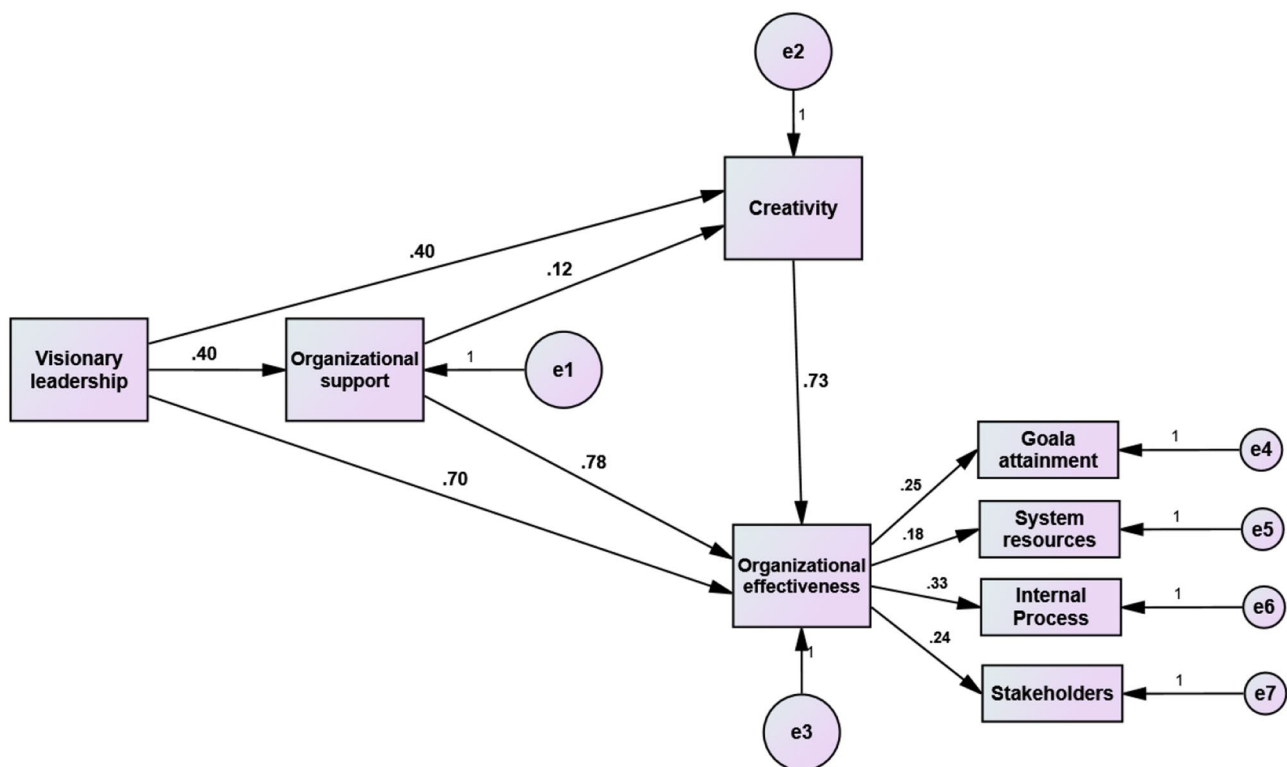


Fig. 2 The mediating effect of organizational support on the relationship between visionary leadership as regards nurse interns' creativity and organizational effectiveness (n = 464)

organizational effectiveness. Nurses are more likely to engage in innovative work tasks when they perceive organizational support. This is because perceived organizational support reduces employees' anxiety about taking risks by increasing their organizational trust in the occasion of failure [6].

Relationship between visionary leadership and nurse interns' creativity

The findings revealed that visionary leadership has a strong and significant direct impact on nurse interns' creativity. This finding is important because it indicates that visionary leadership creates the ideal environment for nurse interns to express and develop their creative potential, which is crucial in a complex and demanding field like healthcare. This leadership style directly fosters creativity by aligning individual contributions with organizational goals, promoting risk-taking, and supporting diverse, innovative ideas.

Correspondingly, Eisenbeiß and Boerner [36] found that visionary leadership positively influences creativity by encouraging risk-taking and novel thinking. Similarly, Zhou et al. [37] found that visionary leadership is positively associated with employee creativity. In the same direction, Apriyani et al. [38] and Darma et al. [39] stated that there was a very significant association between principal visionary leadership and teacher creativity.

Likewise, Makhrus et al. [40] and Rosadi et al. [41] found that a principal's visionary leadership can increase teacher creativity. As well, Cai et al. [42] supported the idea that visionary leadership influences employee creativity. However, this result is contradictory to Amabile and colleagues [43], who argued that while visionary leadership can enhance creativity, the effect is not guaranteed. In the same line, Mumford et al. [44] explored that while their study supports the idea that visionary leadership can promote creativity, it also suggests that structural and resource-related issues can limit creativity, indicating that the correlation may vary depending on organizational conditions. The apparent contradiction with Amabile and colleagues' findings can be attributed to contextual differences.

Relationship between visionary leadership and organizational effectiveness

The current study found that visionary leadership has a strong direct effect on organizational effectiveness, implying that good leadership perceptions directly improve organizational effectiveness. This could be because visionary leadership is unique in its capacity to express a clear and compelling future direction, align team activities, and build an innovative culture, all of which directly contribute to an organization's effectiveness. This finding is supported by Wang et al. [45], who

found that visionary leadership style is associated with improved organizational performance. Moreover, Taylor et al. [46] and Gökbulut and Turan [47] stated that there was a significant direct association between visionary leadership and perceived organizational effectiveness. Conversely, Jing and Avery [48] concluded that there are many issues and holes in the existing studies of the leadership-performance link that must be resolved before a clear depiction of this connection can be drawn. Additionally, this finding is contradicted with that of Obiwuru et al. [49] and Khan et al. [50], who demonstrated that leadership style has an insignificant effect on organizational performance. This contradiction could be attributed to the fact that visionary leadership can enhance organizational effectiveness in nurse interns, who require guidance and purpose, while its impact may be less noticeable in seasoned staff or standardized processes.

Relationship between nurse interns' creativity and organizational effectiveness

In addition, nurse interns' creativity had a direct and positive effect on organizational effectiveness; which can be understood through various mechanisms that link creative problem-solving, innovation, and flexibility to better organizational outcomes in healthcare settings. Nurse interns, despite being new to the profession, contribute fresh ideas and unique approaches that can improve the overall effectiveness of healthcare institutions. This leads up to the similar result as Rahnama [51], who discovered a statistically significant association between employee creativity and organizational effectiveness. Correspondingly, Hamouda and Abd El-Aliem [52] detected that there was a statistically significant positive link between creativity and organizational performance. The alignment between these findings highlights the universal importance of creativity as a driver of organizational effectiveness.

Perceived organizational support mediates the relationship between visionary leadership and nurse interns' creativity

In relation to the mediating effect of organizational support, the current study demonstrated that there is a partial mediating effect of perceived organizational support on the relationship between nurse interns' creativity and visionary leadership. This result is based on the idea that while visionary leadership directly promotes creativity, POS enhances and strengthens this relationship by creating an environment that nurtures and supports creative expression. POS provides the psychological safety, resources, and motivation needed for nurse interns to fully realize their creative potential. However, leadership retains its direct influence, which means that POS enhances rather than replaces the impact of visionary leadership on creativity. These findings align with those

of Li et al. [6], who found that perceived organizational support represented a mediating mechanism in the relationship between nurse interns' creativity and visionary leadership. The similarities between these outcomes highlight the significance of integrating leadership and organizational support measures to increase creativity.

Perceived organizational support mediates the relationship between visionary leadership and organizational effectiveness

Finally, perceived organizational support mediated partially the association between visionary leadership and organizational effectiveness. This might be because, whereas visionary leaders set a clear inspiring vision for the future and motivate individuals to align their efforts with the organization's long-term goals, POS ensures that nurses are motivated, supported, and equipped with the necessary resources and environment to translate that vision into action, leading to better outcomes for the organization. For that reason, visionary leadership alone may not be sufficient to fully optimize organizational effectiveness and the presence of organizational support is essential to enhance and strengthen the effect of visionary leadership on organizational effectiveness. In the same vein, Narcikara and Zehir [53] concluded that the association between spiritual leadership and performance is partially mediated by perceived organizational support. The parallels between these studies underscore the importance of perceived organizational support as a mediating factor in enhancing the effectiveness of leadership styles.

Conclusion

The findings of this study highlight the significant role of visionary leadership in enhancing nurse interns' creativity and organizational effectiveness. A strong perception of visionary leadership was positively correlated with higher creativity and improved organizational outcomes, indicating that leadership styles promoting a shared vision can directly influence both individual and organizational performance.

Moreover, perceived organizational support emerged as a critical mediator between visionary leadership and the outcomes of creativity and organizational effectiveness. Nurse interns who felt supported by their organization demonstrated higher creativity, which in turn enhanced organizational efficiency and goal attainment. This suggests that organizational support not only boosts creativity but also strengthens the positive impact of visionary leadership on organizational effectiveness.

Limitations, practical implications, and recommendations

The study was limited to nurse interns, who may restrict the findings' generalizability and self-reported data may introduce bias in the results.

The study shows that visionary leadership and organizational support are very important in enhancing the creativity and organizational effectiveness of nurse interns. From these findings, long-term care facilities can implement a number of strategies in a practical and sustainable manner to achieve these objectives.

One of the first steps is to develop visionary leadership among nurse managers. So that they can integrate and implement a motivating vision, investment in such training can be made for the leaders. These programs should promote effective communication, strategic planning, and leadership that motivates. Besides, health care services have to motivate people to put organizational vision into practice daily by holding meetings, giving updates, and organizing motivational activities. Mentoring programs can also be developed for interns to help them make contact with experienced leaders to inspire.

Organizational support helps interns to be more creative and inventive. Establishing systems to reward and recognize interns' contributions within facilities will allow the interns to feel valued and a sense of belonging. When interns are equipped with state-of-the-art technology and essential tools, they can perform more creatively and efficiently. By creating channels for communication and making sure that the intern feels free to share ideas or concerns, one can create an open environment that innovates and keeps the interns active.

Positive intergenerational contact programs are another important strategy. Interns and nurses can collaborate to create a better learning opportunity by releasing activities like dual projects, workshops, and patient care initiatives. Interns can learn a lot from storytelling sessions whereby senior nurses talk about their perspectives and experiences. Moreover, a constant social and professional event helps to build effective and positive relationships across generations.

Incorporating creativity and innovation into everyday workflows is another key component in enhancing organizational effectiveness. Another way to improve effectiveness in an organization's day-to-day workflow is to inject creativity and innovation. There should be regular brainstorming sessions organized on the facilities so the interns suggest solutions to the problems of the organization. We can try pilot projects also for idea interns which can let the interns see their ideas in action. Fostering the creative nature of interns requires the creation of flexible work environments where they can test new things while still working within the organizational standards.

Eventually, in order to facilitate sustainability and long-term organizational effectiveness, healthcare facilities

need to create evaluations so as to check the impact of leadership styles and organizational support on interns' performance. You can survey, performance review, and feedback the outcomes on a regular basis. There should also be long-range plans made that integrate visionary leadership principles and organizational support mechanisms in the organization. When all stakeholders are involved in talks about making things better and more effective, there will be buy-ins.

Future Research: Conduct longitudinal studies to explore causal relationships and long-term effects. Investigate moderating factors such as cultural dimensions or team collaboration.

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Author contributions

Made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; MS, AE, HE, and AA. Involved in drafting the manuscript or revising it critically for important intellectual content; MS, AE, HE, and AA. Given final approval of the version to be published. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content; MS, AE, HE, AA and AA. Agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. MS, AE, HE, AA and AA

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Data availability

The data that support the findings of this study are available from the corresponding author upon reasonable request. Also, all data generated or analyzed during this research are included in this manuscript.

Declarations

Ethics approval and consent to participate in the manuscript

The Ethics Committee of the Faculty of Nursing, Zagazig University, granted ethical approval under (reference number 184-24). All necessary information about the study was introduced in the first section of the sheet. The questionnaire included a statement related to the aim and nature of the study. All participants who chose the word agree to give their informed consent before beginning their response to the sheet. The respondents were guaranteed the privacy and confidentiality of their answers, the voluntary nature of their involvement, and the fact that their absence would not hurt their grades or result in any negative outcomes. This ensures that participants could freely choose to participate without the fear of academic repercussions. Participants have given their informed consent under the criteria outlined in the Helsinki Declaration. It was determined that participants had the right to withdraw from the study at any time. The right to withdraw was communicated both verbally and in writing at the outset of the study.

Consent for publication

Not Applicable

Conflict of interest

The authors declare no competing interests.

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